

**METHOD AND APPARATUS FOR A REARRANGEABLY NON-BLOCKING
SWITCHING MATRIX**

Saleh, Ali Najib; Duschatko, Douglas E.; and Quibodeaux, Lane Byron

ABSTRACT OF THE DISCLOSURE

5 A switching apparatus is disclosed that employs a relatively simple and
inexpensive switching matrix, but which avoids interruption of existing connections
when connections are added or removed. The switching matrix switches errorlessly
by controlling the point in time at which switching occurs. Using such a technique,
switching can be performed without disturbing the connections already configured in
10 the switching matrix, and so is referred to herein as being non-blocking. Optionally,
the incoming data can be rearranged to provide a larger window of time in which the
switching matrix can be switched. In the case of a switch using an optical backplane,
this also allows more time for various components of the system (e.g., clock/data
recovery units) to re-acquire lock. The switching apparatus includes a switching
15 matrix and control circuitry. The switching matrix has a matrix input, a control input
and a number of matrix outputs, and is configured to receive an information stream at
the matrix input. The information stream includes a number of portions, while the
control circuitry has a control output coupled to the control input. The control
circuitry is configured to initially configure the switching matrix to output the
20 information stream at a one of the matrix outputs and to subsequently configure the
switching matrix to output the information stream at another of the matrix outputs
during a period of time during which the one of the portions is transiting the switching
matrix.